CMS Shared File System

Rich Smrcina
22 July 2026

Agenda

- Introduction to SFS
- Disk Allocation
- Filepool Configuration
- Accessing the pool
- Authorization
- Space management
- Backup and Recovery
- Byte File System
- Management Tools

VELOCITY SOFTWARE

Makes pools of disk space available

Access controls at file level

One writer/Multiple readers

Hierarchical directory structure

Each user is allocated space in the pool

Provides storage for Byte File System (bfs)

Why SFS?

A minidisk allows for a finite amount of disk space

A minidisk is limited to the size of a disk volume

When a minidisk is full

- A new minidisk must be created
- Files must be copied to the new minidisk
- The old minidisk scratched or deleted

```
USER RICH MYPASS01 16M 16M G
  INCLUDE VSIPROF
  IPL CMS PARM AUTOCR
  MACHINE ESA
  MDISK 0191 3390 00088 00010 CLNW01 MR
```

```
q disk a
LABEL  VDEV M  STAT   CYL TYPE BLKSZ   FILES  BLKS USED-(%) BLKS LEFT  BLK TOTAL
RIC191 191  A   R/W    10 3390 4096        1       1768-98         32       1800
Ready; T=0.01/0.01 13:48:42
```

VELOCITY SOFTWARE

Shared File System

- A pool of disk space (multiple minidisks)
- Users are given access to the filepool
- Space is allocated to each user
- If a user runs out of space
  - User allocation can be increased easily
  - Non-disruptively
- If the filepool runs out of space
  - Additional minidisks can be added
  - Non-disruptively

Disk Allocation

'A' disk for pool definition files and optionally backup

Control minidisk maps the space in the filepool

Log disks help maintain the integrity of the filepool and provide a rollback mechanism

Catalog keeps track of files and directories and access control information for them

Data disk(s) provide storage for end user data

```
IDENTITY VMSYSVPS VELOCITY 96M 96M BG
  INCLUDE IBMDFLT
  BUILD ON VSIVM5 USING SUBCONFIG SFSVPS-1
  IPL CMS
  IUCV ALLOW
  IUCV *IDENT RESANY GLOBAL
  MACH XC
  OPTION MAXCONN 200 APPLMON ACCT QUICKDSP SVMSTAT
  SHARE ABS 3%
  LINK MAINT 0193 0193 RR
*
  SUBCONFIG SFSVPS-1
  MDISK 0191 3390 3331 0030 VM5W01 MR
  *Control
  MDISK 0301 3390 3361 0020 VM5W01 WR
  *Logging
  MDISK 0302 3390 3381 0010 VM5W01 WR
  MDISK 0303 3390 3391 0010 VM5W01 WR
  *Catalog
  MDISK 0304 3390 3401 0010 VM5W01 WR
  *DATA
  MDISK 0305 3390 3411 0450 VM5W01 MR
```

VELOCITY SOFTWARE

Mapping minidisks into the filepool

```
MDISK 0191 3390 3331 0030 VM5W01 MR
*Control
MDISK 0301 3390 3361 0020 VM5W01 WR
*Logging
MDISK 0302 3390 3381 0010 VM5W01 WR
MDISK 0303 3390 3391 0010 VM5W01 WR
*Catalog
MDISK 0304 3390 3401 0010 VM5W01 WR
*DATA
MDISK 0305 3390 3411 0450 VM5W01 MR
```

POOLDEF file

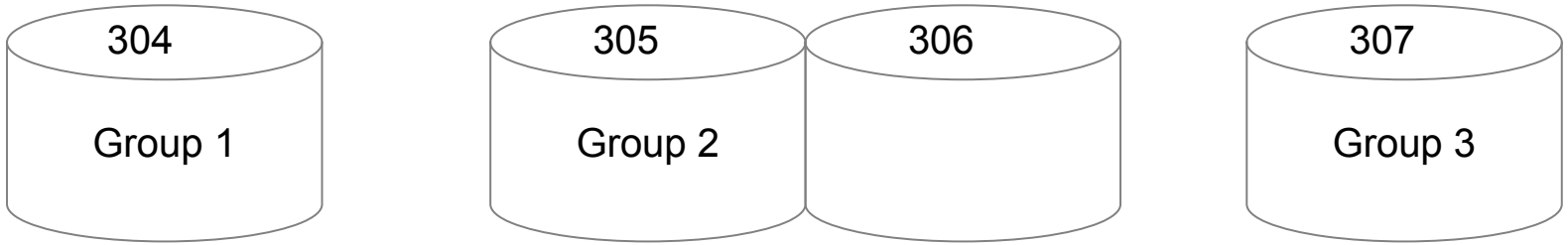
```
MAXUSERS=500
MAXDISKS=500
DDNAME=CONTROL   VDEV=301
DDNAME=LOG1      VDEV=302
DDNAME=LOG2      VDEV=303
DDNAME=BACKUP    DISK  FN=CONTROL  FT=BACKUP    FM=A
DDNAME=MDK00001 VDEV=304 GROUP=1
DDNAME=MDK00002 VDEV=305 GROUP=2
```

VELOCITY SOFTWARE

Grouping minidisks

POOLDEF file

```
MAXUSERS=500
MAXDISKS=500
DDNAME=CONTROL  VDEV=301
DDNAME=LOG1     VDEV=302
DDNAME=LOG2     VDEV=303
DDNAME=BACKUP   DISK  FN=CONTROL  FT=BACKUP   FM=A
DDNAME=MDK00001 VDEV=304 GROUP=1
DDNAME=MDK00002 VDEV=305 GROUP=2
DDNAME=MDK00003 VDEV=306 GROUP=2
DDNAME=MDK00004 VDEV=307 GROUP=3
```



Two files used to define/configure a filepool

DMSPARMS file

```
ADMIN MAINT FTPSERVE ZVPS ZADMIN
BACKUP
SAVESEGID CMSFILES
FILEPOOLID VMSYSVPS
USERS 200
```

POOLDEF file

```
MAXUSERS=500
MAXDISKS=500
DDNAME=CONTROL  VDEV=301
DDNAME=LOG1     VDEV=302
DDNAME=LOG2     VDEV=303
DDNAME=BACKUP   DISK  FN=CONTROL  FT=BACKUP   FM=A
DDNAME=MDK00001 VDEV=304 GROUP=1
DDNAME=MDK00002 VDEV=305 GROUP=2
```

VELOCITY SOFTWARE

DMSPARMS parameters

ADMIN – defines filepool administrators

- Also BFS super users

BACKUP – automatic backup of control data

- Kicks in when logs are 80% full

SAVESEGID – name of saved segment that contains filepool executable code

FILEPOOLID – name of THIS filepool

- Also the filename of the POOLDEF file

USERS – Estimate of the number of users

POOLDEF parameters

MAXUSERS – number of filepool users authorized to create objects

- Files, directories, aliases
- Used to calculate size of catalog and control areas

MAXDISKS – number of minidisks ever to be used by this filepool server

Generate the filepool

Log on to filepool server

Format the A-disk

Create POOLDEF, DMSPARMS and PROFILE EXEC

Access the 193 disk

Issue the command:

```
FILESERV GENERATE VMSYSVPS POOLDEF
```

FILESERV GENERATE output

```
DMSWFV1117I FILESERV processing begun at 19:12:41 on 12 Jul 2011
DMSWFV1121I VMSYSVPS DMSPARMS A1 will be used for FILESERV processing
DMS4PD3400I Initializing begins for DDNAME = CONTROL
DMS4PD3400I Initializing ends for DDNAME = CONTROL
DMS4PD3400I Initializing begins for DDNAME = MDK00001
DMS4PD3400I Initializing ends for DDNAME = MDK00001
DMS4PD3400I Initializing begins for DDNAME = MDK00002
DMS4PD3400I Initializing ends for DDNAME = MDK00002
DMS4PD3400I Initializing begins for DDNAME = LOG1
DMS4PD3400I Initializing ends for DDNAME = LOG1
DMS4PD3400I Initializing begins for DDNAME = LOG2
DMS4PD3400I Initializing ends for DDNAME = LOG2
DMS5FD3032I File pool server has terminated
DMSWFV1120I File VMSYSVPS POOLDEF A1 created or replaced
DMSWFV1117I FILESERV processing ended at 19:13:02 on 12 Jul 2011
```

Backup the control area

FILESERV BACKUP

Create PROFILE EXEC

```
/* VMSYSVPS PROFILE EXEC */
'CP SPOOL CON ZVPS START'
'CP SET PF12 RETRIEVE'
'ACCESS 193 B'
'CP SET RUN ON'
'CP SET EMSG ON'
'FILESERV START'
```

Execute PROFILE to start filepool server

```
DMSACP723I B (193) R/O
DMSWFV1117I FILESERV processing begun at 20:00:53 on 12 Jul 2011
DMSWFV1121I VMSYSVPS DMSPARMS A1 will be used for FILESERV processing
DMSWFV1121I VMSYSVPS POOLDEF A1 will be used for FILESERV processing
DMS5BB3045I Ready for operator communications
```

Users are enrolled in the filepool

- Lets them connect to the pool
- Allows access to directories and files

ENROLL USER RICH VMSYSVPS

Users can be given space in the filepool

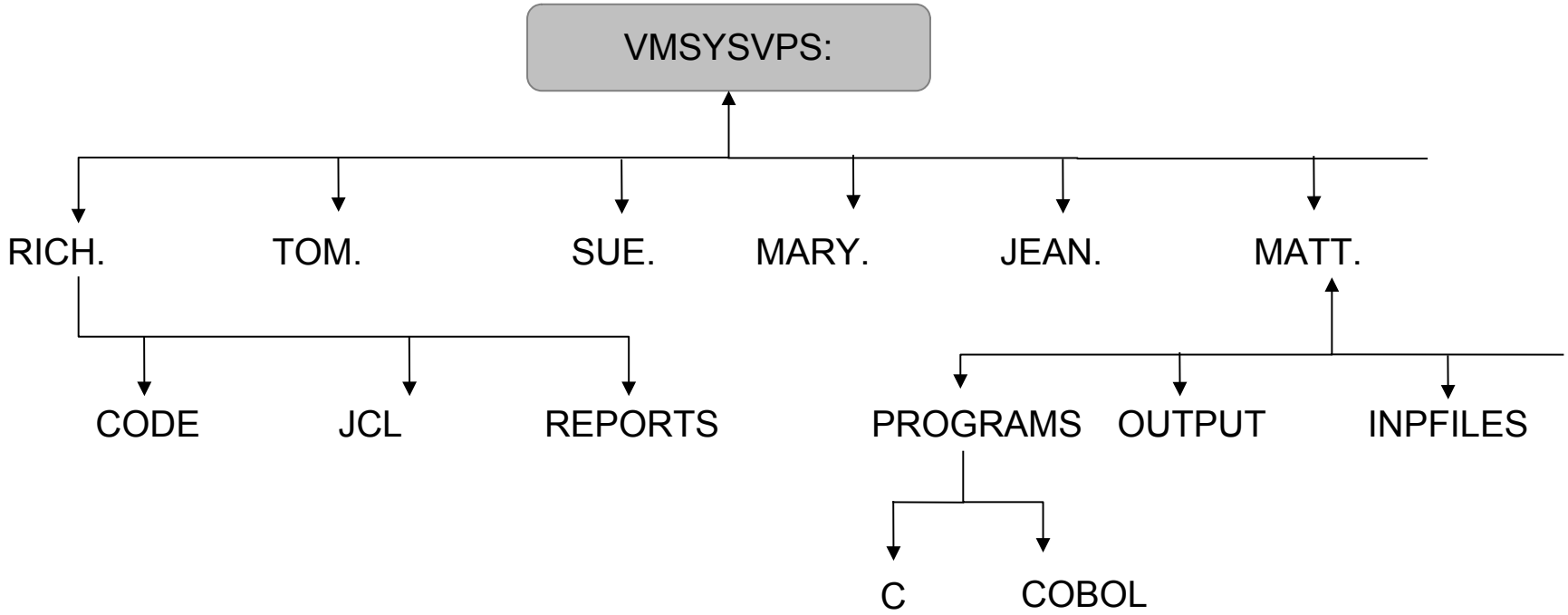
ENROLL USER RICH VMSYSVPS (BLOCKS 20000

Or in a specific group

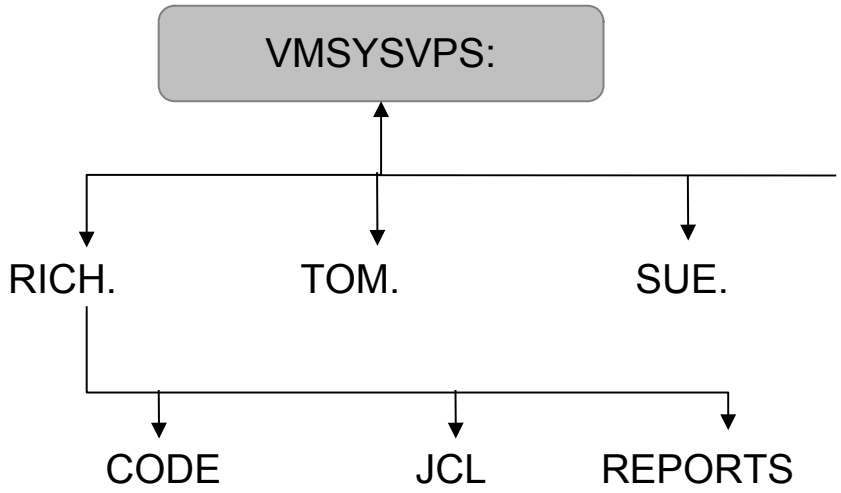
ENROLL USER RICH VMSYSVPS (BLOCKS 20000 GROUP 3

Hint: 100 cylinders is approximately 18,000 4K blocks

Conceptual view



Accessing the pool



Use CMS ACCESS command

First component is filepool name

Then top level directory and any subdirectories

ACC VMSYSVPS:TOM. B

ACC VMSYSVPS:RICH.REPORTS D

VELOCITY SOFTWARE

Set the default filepool

```
SET FILEPOOL VMSYSVPS
```

Set top level directory as A-disk

```
IPL CMS PARM AUTOCR FILEPOOL VMSYSVPS:
```

Different pools can be accessed

```
ACC VMSYSVPS:RICH.REPORTS B
ACC VMSYSU:TOM. Q
```

VMLINK command

```
VMLINK .DIR VMSYSVPS:MATT.PROGRAMS
```

Which directories are accessed?

q accessed

```
Mode  Stat     Files  Vdev  Label/Directory
A      R/W         6  DIR   VMSYSVPS:RICH.
E      R/W         3  DIR   VMSYSVPS:RICH.CODE
F      R/W         0  DIR   VMSYSVPS:RICH.REPORTS
G      R/W         2  DIR   VMSYSVPS:RICH.JCL
H      R/O       624  592   TCM592
S      R/O       696  190   MNT190
Y/S    R/O      1125  19E   MNT19E
```

q search

```
-       DIR   A    R/W   VMSYSVPS:RICH.
-       DIR   E    R/W   VMSYSVPS:RICH.CODE
-       DIR   F    R/W   VMSYSVPS:RICH.REPORTS
-       DIR   G    R/W   VMSYSVPS:RICH.JCL
TCM592  592   H    R/O
MNT190  190   S    R/O
MNT19E  19E   Y/S  R/O
```

VELOCITY SOFTWARE

Some commands allow directory ID specification

```
ERASE RACF DATA VMSYSVPS:RICH.

FILELIST * * VMSYSVPS:RICH.REPORTS

RENAME SMFDMPLS JCL VMSYSVPS:RICH.JCL SMFDMPLS JCLOLD VMSYSVPS:RICH.JCL
```

See individual command syntax

Display directory hierarchy with LISTDIR

```
LISTDIR
 Fm Directory Name
 A  VMSYSVPS:RICH.
 E  VMSYSVPS:RICH.CODE
 G  VMSYSVPS:RICH.JCL
 F  VMSYSVPS:RICH.REPORTS

 LISTDIR VMSYSVPS:ZVPS.
 Fm Directory Name
 -  VMSYSVPS:ZVPS.
 -  VMSYSVPS:ZVPS.CONFIG
 -  VMSYSVPS:ZVPS.CONSOLES
 -  VMSYSVPS:ZVPS.INSTALL
 -  VMSYSVPS:ZVPS.WORK
```

Full screen display of directory hierarchy with DIRLIST

```
    RICH     DIRLIST  A0  V 319  Trunc=319 Size=4 Line=1 Col=1 Alt=0
Cmd   Fm Directory Name
      A  VMSYSVPS:RICH.
      E  VMSYSVPS:RICH.CODE
      G  VMSYSVPS:RICH.JCL
      F  VMSYSVPS:RICH.REPORTS


   1= Help       2= Refresh  3= Quit   4= Sort(fm)    5= Sort(dir)   6= Auth
   7= Backward   8= Forward  9=       10=           11= Filelist   12= Cursor

   ====>
                                                          X E D I T  1 File
```

Directory Types

- Directory attributes are specified at creation
- Two different attributes
  - Directory Control (DIRCONTROL)
  - File Control (FILECONTROL)
- DIRCONTROL directories work like minidisks
  - One writer, Multiple readers
  - Authorization given at directory level
  - Suited primarily for read activity
- FILECONTROL directories much more flexible
  - Multiple writers and readers
  - Authorization given at file level

VELOCITY SOFTWARE

Access is granted to a directory

Four types of directory access

- READ
- NEWREAD
- WRITE
- NEWWRITE

VELOCITY SOFTWARE

READ

- Allows access to a directory
- See the files and sub-directories

NEWREAD

- Implies READ
- Allows a user to see new files or sub-directories

WRITE

- Implies READ
- Allows a user to create new files

NEWWRITE

- Implies WRITE
- Allows a user to write to new files

To give a user full access to a directory

```
GRANT AUTH VMSYSVPS:TOM. TO RICH (NEWREAD NEWWRITE
```

Give a user read access to a directory

```
GRANT AUTH VMSYSVPS:RICH.JCL TO TOM (NEWREAD
```

Access can also be granted to a file or files in a directory

Two types of file access

- READ, WRITE

READ

- See the contents of a file

WRITE

- Change the contents of a file
- Rename and erase a file
- Requires write access to the directory

Grant read access to a file

```
GRANT AUTH BADCODE COBOL VMSYSVPS:TOM.CODE TO RICH (READ
```

Grant all access to a file

```
GRANT AUTH GOODCODE C VMSYSVPS:RICH.CODE TO TOM (WRITE
```

Grant access to all files in a directory

```
GRANT AUTH * * VMSYSVPS:MATT.REPORTS TO RICH (READ
```

Enrolled users also have access to PUBLIC areas, directories or files granted to PUBLIC

```
GRANT AUTH VMSYSVPS:MATT.REPORTS TO PUBLIC (NEWREAD
```

All users can be allowed to connect

```
ENROLL PUBLIC VMSYSVPS:
```

GRANT AUTHORITY command is used to allow users to access files and directories

- Can be issued by ADMIN or OWNER

GRANT is reversed with REVOKE AUTHORITY

ADMIN authority

- Users listed in ADMIN statement in POOLDEF
- Users listed in ENROLL ADMIN

```
ENROLL ADMIN RICH
```

Storage group messages

```
DMS4KC3202W Storage group 2 is short on storage
DMS4DL3201E Storage group 2 is full
```

DMS3202W is issued based on the GROUPTHRESH parameter

- In the DMSPARMS file
- Default is 90%

Check minidisk and storage group space

q filepool minidisk vmsysvps

```
                        VMSYSVPS File Pool Minidisks

     Start-up Date 09/01/23                                Query Date 06/07/24
     Start-up Time 06:30:11                                Query Time 11:00:26
     ================================================================================
     FILE POOL MINIDISK INFORMATION

             500  Maximum Number of Minidisks
               3  Minidisks in Use
     ================================================================================
     STORAGE GROUP MINIDISK INFORMATION

     Storage      Minidisk        4K Blocks       4K Blocks        Virtual
     Group No.    Number            In-Use          Free           Address
         1            1          2988 -  83%        600            0304
         1            3          2449 -  27%       6534            0306
         2            2        141425 -  26%     398006            0305
     ================================================================================
     STORAGE GROUP MINIDISK TOTALS

     Storage        4K Blocks       4K Blocks
     Group No.        In-Use          Free
         1          5437 -  43%       7134
         2        141425 -  26%     398006
```

Check minidisk and storage group space

```
================================================================================
LOG INFORMATION

First Log Virtual Address         0302
Second Log Virtual Address        0303

    17972  Number of Log Minidisk 4K Blocks
      36%  Percent(%) of Log Space Used
      95%  LUW Rollback/Suspend Threshold (% Log Space)
      80%  Backup Threshold (% Log Space)
    06/06/24  Date of Last Control Backup
    21:30:00  Time of Last Control Backup
================================================================================
CONTROL MINIDISK INFORMATION

    Control Minidisk Virtual Address  0301
    14570  Number of Control Minidisk 512 Blocks
```

Filespace messages

```
DMSCPY1141W User filespace threshold exceeded for file pool SFSVM5

DMSCPY1254E An attempt to commit will exceed the number of 4K
blocks allowed for the user in file pool SFSVM5
```

Check filespace allocation

q limits for rich

Userid	Storage Group	4K Block Limit	4K Blocks Committed	Threshold
RICH	2	2000	18-00%	90%

q limits all

Userid	Storage Group	4K Block Limit	4K Blocks Committed	Threshold
BARTON	2	0	0-00%	90%
DSADEV	2	0	0-00%	90%
OPERATOR	2	20000	1231-06%	90%
ZADMIN	2	180	3-01%	90%
ZMAP	2	1000000	1246-00%	90%
ZMON	2	3600	1562-43%	90%
ZSERVE	2	180	3-01%	90%
ZTCP	2	5400	302-05%	90%
ZVPS	2	200000	62547-31%	90%
ZVWS	2	5580	2531-45%	90%
ZWEBLOG	2	1800	1185-65%	90%
ZWEB01	2	180	3-01%	90%
ZWEB02	2	180	3-01%	90%
ZWEB03	2	180	3-01%	90%
ZWEB04	2	180	3-01%	90%
ZWEB05	2	180	3-01%	90%
ZWRITE	2	1000000	686-00%	90%

Controlling filespace allocation

```
ENROLL USER TOM (BLOCKS 2000
```

Increase/reduce filespace allocation

```
MODIFY USER +1000 FOR MATT
MODIFY USER -500 FOR TOM
```

Delete filespace

```
DELETE JEAN
```

Add space to a storage group

- Add a minidisk to the server
- Create a file describing the new minidisk
- Expand storage group

Add minidisk to the server

```
MDISK 0307 3390 3251 0500 VM5W02 WR
```

Create a file describing the new minidisk

- On an admin ID
- Eg: NEW307 POOLDEF A

```
DDNAME=MDK00004 VDEV=307 GROUP=2
```

```
MAXUSERS=500
MAXDISKS=500
DDNAME=CONTROL          VDEV=301
DDNAME=LOG1             VDEV=302
DDNAME=LOG2             VDEV=303
DDNAME=BACKUP   DISK    FN=CONTROL     FT=BACKUP    FM=C
DDNAME=MDK00001         VDEV=304       GROUP=1   BLOCKS=1790
DDNAME=MDK00002         VDEV=305       GROUP=2   BLOCKS=80906
DDNAME=MDK00003         VDEV=306       GROUP=2   BLOCKS=3588
```

Expand storage group

```
VMLINK MAINT 193
DMSVML2060I MAINT 193 linked as 0120 file mode X

FILEPOOL MINIDISK VMSYSVPS NEW307 POOLDEF A
DMSWFP3485I FILEPOOL processing begun at 07:53:36 on 15 Jun 2024.
DMSJMD3426I The following minidisk(s) will be formatted and reserved
DMSJMD3426I for VMSYSVPS on RKS2LV
DMSJMD3426I MDK00004 0307 00002
DMSJMD3427R FORMAT will erase all files on the above minidisk(s).
DMSJMD3427R Do you wish to continue? Enter 1 (Yes) or 0 (No)
1
DMSJMD3533I Linking to minidisk MDK00003 at 0307 as FFFF.
DASD FFFF DETACHED
DMSJMD3423I The minidisk with virtual device address FFFF has been formatted
DMSJMD3922I 1 minidisk(s) added to the file pool
DMSJMD3428I New minidisk(s) will not be available for use until a
DMSJMD3428I confirmation message is sent to your virtual reader
DMSWFP3486I FILEPOOL processing ended at 07:53:55 on 15 Jun 2024.
```

Backups

- Control data
- User data

Control data

- User allocations
- Authorizations
- Storage group 1, control disk and POOLDEF file
- Control backups are automatic when logs fill

From an admin

```
FILEPOOL CONTROL BACKUP
```

User data

Files and directories that users create

Two type of user backup

FILEPOOL BACKUP

FILEPOOL UNLOAD

Both admin commands

Can be issued concurrent with filepool operations

FILEPOOL BACKUP

Used to back up a storage group

FILEDEF must be issued to define the backup file

```
FILEDEF BACKUP DISK VMSYSVPS BKUP2 D
FILEPOOL BACKUP 2
```

Restore from BACKUP

Restore a storage group

FILEDEF must be issued to define the backup file

```
FILEDEF RESTORE DISK VMSYSVPS BKUP2 D
FILEPOOL RESTORE 2
```

Restore from BACKUP

Restore individual files

Create a file containing the list of files to restore

- CONTROL FILELOAD A
- *filename filetype dirname*

eg:

```
INSTALL LOG ZVPS.
ZMON 20140531 ZVPS.CONSOLES
```

FILEDEF must be issued to define the backup file

```
FILEDEF RESTORE DISK VMSYSVPS BKUP2 D
FILEPOOL FILELOAD 2
```

FILEPOOL UNLOAD

Used to back up a storage group or filespace

Storage group, file space or individual files can be recovered

FILEDEF must be issued to define the backup file

```
FILEDEF UNLOAD DISK VMSYSVPS UNLD2 D
FILEPOOL UNLOAD GROUP 2
         - or -
FILEPOOL UNLOAD FILESPACE RICH
```

Restore from UNLOAD

Restore storage group

FILEDEF must be issued to define the backup file

```
FILEDEF RELOAD DISK VMSYSVPS UNLD2 D
FILEPOOL RELOAD GROUP 2
```

Restore from UNLOAD

Restore file space

FILEDEF must be issued to define the backup file

The GROUP option on the RELOAD can be used to move a filespace to a different group

- Use ALL option on UNLOAD
- Backs up aliases and authorizations by other users

```
FILEDEF RELOAD DISK VMSYSVPS UNLD2 D
FILEPOOL RELOAD FILESPACE USER RICH [GROUP n]
```

Restore from UNLOAD

Restore individual file

Create a file containing the list of files to restore

- CONTROL RELOAD A
- *filename filetype dirname*

eg:

```
INSTALL LOG ZVPS.
ZMON 20140531 ZVPS.CONSOLES
```

FILEDEF must be issued to define the backup file

```
FILEDEF RELOAD DISK VMSYSVPS UNLD2 D
FILEPOOL RELOAD FILES
```

Additional information

- All FILEPOOL commands require access to MAINT 193
- Backups/Restores can use tape
- Read usage notes!

Open Extensions implements POSIX standards under CMS

- POSIX 1003.1 (POSIX.1) - System Interfaces
- POSIX 1003.1a (POSIX.1a) - Extensions to POSIX.1
- POSIX 1003.1c (POSIX.1c) - Threads
- POSIX 1003.2 (POSIX.2) - Shell and Utilities

Provides POSIX compliant file system

Shell and Utilities

Traditionally used to port UNIX features

- Now used for z/OS packages on z/VM
  - LDAP, SSL, MPROUTE, etc.

Provides POSIX compliant file system

- Stored as a filespace in SFS
- Byte-stream view and format
- Long file/directory names
- Many possible directory levels
- Unix style permissions
- Unix command set

Shell and Utilities

- Provides a command line interface
- Runs OE programs
- Environment variables and aliases
- Shell script programming
- Manipulate BFS files
- Ported applications
- Development utilities

Creating a BFS filespace

ENROLL USER MATT (BLOCKS 20000 BFS

Specifying a BFS path in CMS command

/../VMBFS:filepool:filespace/

Required part of the path identifier

File pool that contains the data

BFS filespace to reference

Integrating BFS actions in CMS

- OPENVM command allows manipulation of BFS objects from CMS
- CREATE DIRECTORY – Create a directory
- ERASE – Delete a file or directory
- GETBFS – Extract BFS object into CMS
- LISTFILE – List files in a directory
- MOUNT/UNMOUNT – Mount/unmount a filespace
- OWNER – Change owner of file or directory
- PERMIT – Change permissions of file or directory
- PUTBFS – Insert CMS file into BFS
- SET DIRECTORY – Change current working directory
- SHELL – Start OPENVM shell

Starting the shell

```
openvm mount /../vmbfs:vmsys:root/ /
Ready; T=0.01/0.02 08:05:03
openvm shell

IBM
Licensed Material - Property of IBM
5654-A17 (C) Copyright IBM Corp. 1995
(C) Copyright Mortice Kern Systems, Inc., 1985, 1993.
(C) Copyright Software Development Group, University of Waterloo, 1989.

All Rights Reserved.

U.S. Government users - RESTRICTED RIGHTS - Use, Duplication, or
Disclosure restricted by GSA-ADP schedule contract with IBM Corp.

IBM is a registered trademark of the IBM Corp.


#
```

Starting the shell

```
#
pwd
/
#
ls -l
total 0
drwxr-xr-x   1 maint630 system          0 May 29  2013 bin
drwxr-xr-x   1 maint630 system          0 May 29  2013 dev
Erwxrwxrwx   1 maint630 system         21 May 29  2013 etc → /../VMBFS:VMSYSU:ETC
drwxr-xr-x   1 maint630 system          0 May 29  2013 home
lrwxrwxrwx   1 maint630 system          8 May 29  2013 lib -> /usr/lib
drwxr-xr-x   1 maint630 system          0 May 29  2013 opt
Erwxrwxrwx   1 maint630 system         21 May 29  2013 tmp -> /../VMBFS:VMSYSU:TMP
lrwxrwxrwx   1 maint630 system          5 May 29  2013 u -> /home
drwxr-xr-x   1 bin      bin             0 May 29  2013 usr
Erwxrwxrwx   1 maint630 system         21 May 29  2013 var -> /../VMBFS:VMSYSU:VAR
```

Similar command set

```
#
ps -ef
     UID        PID       PPID    STIME TTY       TIME COMMAND
maint630       3868          1 17:42:23 tty       0:00
maint630       4098          1 16:46:59 tty       0:00
maint630       4360       3868 17:42:24 tty       0:00 sh -L
maint630       4625       4360 20:40:03 tty       0:00 ps -ef
```

Other commands

alias, awk, bg, c89, cat, cd, chgrp, chmod, chown, cp, cut, date, echo, find, grep, head, join, ln, ls, make, mv, pax, sleep, tail, tar, type

A number of tools ported

VM OpenEdition Ported Packages

- gzip, gnumake, syslog, ldapd, apache

“Porting Unix Applications to OpenEdition for VM/ESA” - SG24-5458

Read about the process

VM Downloads page

http://www.vm.ibm.com/download/packages/

Name	Types	Date	Abstract
SFSKTOOL	v-365K	2011-02-28	Various tools related to SFS management. V1.0
SFSULIST	v-134K	2011-02-28	SfsUserList lets you handle SFS users in a FILELIST like way V1.13
SETDATE	v-9K	2009-10-27	SETDATE EXEC - Set the date of last update on CMS or SFS files.
NONAMES	v-5K	2008-08-06	Avoid NAMEFIND lookup for SFS administrative commands
ERALIAS	v-8K	2002-10-25	An exec to remove ERASEd ALIASes from the SFS catalog.
DIREXEC	v-65K	2000-05-01	Execute or execload execs from non-accessed SFS directories.
XSFS	v-76K	2000-05-01	XEDIT files that reside in unaccessed SFS directories.
OBFUSCAT	v-8K	1996-12-16	Prevent direct links by randomly changing file and HTML link names in SFS.
FPUBLIC	v-16K	1996-08-26	Identify SFS Files and Directories with PUBLIC Access
PIPEFILE	v-47K	1996-08-26	Modern Pipelines file I/O using DMSREAD/DMSWRITE; SFS
SFSTAR	v-32K	1996-08-26	Archive (zip up) SFS directory tree into file/pipeline stream
WORF	v-30K	1996-08-26	Simple Shared File System (SFS) external security manager (ESM)
WORFAUTH	v-11K	1996-08-26	WORF SFS ESM rule database updater

CMS File Pool Planning, Administration, and Operation

CMS Commands and Utilities Reference

CMS User's Guide

OpenExtensions Shell Commands

OpenExtensions User's Guide

OpenEdition for VM/ESA Implementation and Administration Guide (SC24-4747)

Porting UNIX Applications to OpenEdition for VM/ESA (SG24-5458)

Questions?

CMS Shared File System

Thank you for attending!

Training, Education and Information

https://velocitysoftware.com/educate/

Presentations and Handouts

https://velocitysoftware.com/pdfs/